

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

REMARKS

The Examiner has stated that the amended title of the present invention is not descriptive.

Also, the Examiner has objected to the abstract, stating that the abstract does not describe a method of making a wiring substrate drawn to the elected embodiment sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

Applicants have amended the title and the abstract to more narrowly describe the present invention. Namely, the abstract and title have been amended to coincide with the present invention as set forth in Claim 2.

The Examiner has rejected claim 2 under 35 U.S.C. §102(e) as being anticipated by *Ohsawa et al.*, U.S. Patent No. 5,901,436.

Applicants respectfully traverse on the following basis.

Ohsawa et al. '436 does not disclose the use of an insulating layer such as a liquid photosensitive polyimide or epoxy between the copper base and wiring films. See Application, page 15. Claim 2 specifically discloses the use of such an insulating film, ("... forming at least one layer on a base made of metal through an insulating film. . .").

If the prior art reference does not contain every element recited in the claim in as complete detail as is contained in the claim and arranged and recited in the claim, the reference does not anticipate the invention. As will be explained below, the lack of an insulating film in *Ohsawa et al.* '436 results in a significantly different semiconductor device from the present invention.

With regard to *Ohsawa* a wiring circuit is formed on the metal board by electrolytic plating directly. In the present invention, a wiring circuit is pre-formed on the metal board by removing the

U.S. Patent Application Serial No. 09/466,895

part connected electrically to pre-form dielectric layers and metalize, then pre-forming wiring circuits by the electrolytic plating method. Please see the attached diagram which highlights the process for forming differences and the resultant structural differences between the reference and the present invention.

Thus, in *Ohsawa*, wired circuits and the base metal board are short circuited electrically so the base metal board has to be removed at the final stage. However, in the present invention, removing the base metal mentioned above is not required as the circuit board is insulated from the base metal board.

From the above in the present invention, the following applications which are not available in the reference can be obtained, that is:

- (1) three dimensional connecting terminals are formed by removing the base metal while retaining a terminal portion,
- (2) by retaining the base metal corresponding circuit wiring, such retained portions of the base metal are used as an electric source plane layer and a ground layer,
- (3) by retaining the base metal under the circuit wiring while removing an LSI chip accommodating portion of the base metal as a ball grid alley (BGA) substrate, it functions as a heat spreader thus attaching an extra heat spreader layer is not necessary,
- (4) by forming metal bumps, primary terminals (connected to pads of LSI chip) for mounting flip chips are formed, therefore there is no need to apply any wafer bump, and

U.S. Patent Application Serial No. 09/466,895

(5) by the present invention, secondary terminals of a chip size package can be formed.

Normally, solder balls are mounted after packaging.

As to the Examiner's outstanding objection to the Abstract of the Disclosure, as indicated above, the applicants have deleted the current Abstract, and submit herewith a substitute Abstract of the Disclosure in place therefor.

The Applicants respectfully request that the substitute Abstract of the Disclosure submitted herewith be approved by the Examiner.

It is believed that this Amendment is fully responsive to the Office Action dated **August 29, 2002**.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

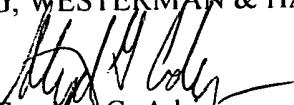
Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

U.S. Patent Application Serial No. 09/466,895

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP


Stephen G. Adrian
Attorney for Applicant
Reg. No. 32,878

MJC/SGA/rer

Atty. Docket No. **991450**
Suite 1000, 1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



23850

PATENT TRADEMARK OFFICE

Enclosures: Version with markings to show changes made
Substitute Abstract of the Disclosure
Diagram - The comparisons of the characters on the process and the structure

Q:\FLOATERS\Mike Caridi\99\991450\Amendment - 2nd OA 11-29-02

VERSION WITH MARKINGS TO SHOW CHANGES MADE
U.S. SERIAL NO. 09/466,895

IN THE TITLE:

The title of the invention has been amended, in its entirety, so as to read as follows:

[“METHOD FOR FABRICATING A WIRING SUBSTRATE”]

**A METHOD FOR FABRICATING A WIRING SUBSTRATE BY ELECTROPLATING A
WIRING FILM ON A METAL BASE**